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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,049	01/26/2001	Douglas Elmer Wallace JR.	16356.581 (DC-02749)	7240

27683 7590 01/05/2005

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EXAMINER

GARCIA OTERO, EDUARDO

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/771,049

Applicant(s)

WALLACE, DOUGLAS ELMER

Examiner

Eduardo Garcia-Otero

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,7,10,11,17 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,7,10,11,17 and 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION: Final

Introduction

1. Title is: Computer system and printed circuit board manufactured in accordance with a quasi-Monte Carlo simulation technique for multi-dimensional spaces.
2. First named inventor is: Wallace.
3. The pending claims are: 1, 7, 10, 11, 17, and 20-22.
4. US application filed 1/26/2001, no earlier priority is claimed.
5. Applicant's Amendment with drawings was received 10/22/04.

Index of Important Prior Art

6. Traub refers to US patent 6,058,377.
7. Chudnovsky refers to US patent 6,381,669.
8. Miller refers to US patent 6,539,531.
9. Niederreiter refers to "Some Linear and Nonlinear Methods for Pseudorandom Number Generation", by Harald Niederreiter, Proceedings of the 1995 Winter Simulation Conference, pages 250 to 254.

Applicant's Remarks

10. Applicant has satisfied the request for information.
11. Applicant has provided black and white formal drawings, as a substitute for the prior colored drawings (because color is not essential).
12. The Examiner appreciates Applicant's clear discussion of the bit-reversal technique for QM random number generation at Remarks pages 11-13. This technique has some interesting and useful properties. The prior objection to the specification is withdrawn due to Applicant's amendments and remarks.
13. The prior 35 USC 112 rejections are withdrawn due to Applicant's amendments and remarks.
14. The 35 USC 102 rejections are withdrawn due to Applicant's amendments and remarks.
15. Only the 35 USC 101 rejections are maintained. See detailed discussions below. All other objections and rejections are withdrawn.

35 USC § 101-statutory subject matter

16. 35 U.S.C. 101 reads as follows: Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
17. Claims 1, 7, 10, 11, 17, and 20-22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.
18. Specifically, the claims are directed towards manipulation of an abstract idea (creating geometric models), without producing “useful, concrete, and tangible” results as required by *In re Alappat*, 33 F.3d 1524, 1544, 31 USPQ2d 1545, 1557 (Fed. Cir. 1994). An additional limitation in the independent claims using the simulated multi-dimensional space for a “useful, concrete, and tangible” purpose would satisfy the requirements of 35 USC 101. See MPEP 2106(II)(A).
19. Claim 1 (currently amended) states “method for simulating a multi-dimensional space”. This does not appear to produce a “useful, concrete, and tangible” result as required by *In re Alappat*.
20. Claim 11 (currently amended) states “method for simulating trace impedance of a printed circuit board”, which comes much closer to satisfying *In re Alappat* than does claim 1.
21. However, the claim 11 express limitations merely state “generating a sequence... mapping each pseudo-random number... selecting a value of S...”. It is not clear how these express limitations accomplish the implied preamble limitation of “simulating trace impedance of a printed circuit board”.
22. Note *In re Sarker*, 200 USPQ 132, (CCPA), Dec. 7 1978 at page 137 discusses the significance of “post-solution activity” like building a bridge or a dam, and states “While it is true that the final step in each of these claims makes reference to the mathematical result achieved by performing the prior recited steps, **we consider the connection to be so tenuous that the several steps recited in each claim when considered as a whole do not constitute a proper method under the statute**”. Emphasis added.
23. Similar to *In re Sarker*, the present claim 11 (currently amended) “post-solution activity” limitation of “method for simulating trace impedance of a printed circuit board” is so tenuous that it does not constitute a proper method under 35 USC 101.

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24. The other pending claims are similar to either claim 1 or to claim 11.
25. Thus, claims 1, 7, 10, 11, 17, and 20-22 require a clear (non-tenuous) connection to a useful concrete and tangible result.
26. See MPEP 2106(II)(A), particularly the section reproduced below:

Although the courts have yet to define the terms useful, concrete, and tangible in the context of the practical application requirement for purposes of these guidelines, the following examples illustrate claimed inventions that have a practical application because they produce useful, concrete, and tangible result:

Claims drawn to a long-distance telephone billing process containing mathematical algorithms were held to be directed to patentable subject matter because "the claimed process applies the Boolean principle to produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle." *AT & T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358, 50 USPQ2d 1447, 1452 (Fed. Cir. 1999);

"[T]ransformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces a useful, concrete and tangible result' -- a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades." *State Street*, 149 F.3d at 1373, 47 USPQ2d at 1601; and

Claims drawn to a rasterizer for converting discrete waveform data samples into anti-aliased pixel illumination intensity data to be displayed on a display means were held to be directed to patentable subject matter since the claims defined "a specific machine to produce a useful, concrete, and tangible result." *In re Alappat*, 33 F.3d 1526, 1544, 31 USPQ2d 1545, 1557 (Fed. Cir. 1994).

A process that consists solely of the manipulation of an abstract idea is not concrete or tangible. See *In re Warmerdam*, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). See also *Schrader*, 22 F.3d at 295, 30 USPQ2d at 1459. Office personnel have the burden to establish a prima facie case that the claimed invention as a whole is directed to solely an abstract idea or to manipulation of abstract ideas or does not produce a useful result. Only when the claim is devoid of any limitation to a practical application in the technological arts should it be rejected under 35 U.S.C. 101. Compare *Musgrave*, 431 F.2d at 893, 167 USPQ at 289; *In re Foster*, 438 F.2d 1011, 1013, 169 USPQ 99, 101 (CCPA 1971). Further, when such a rejection is made, Office personnel must expressly state how the language of the claims has been interpreted to support the rejection.

Patentable material

27. At present, the Examiner believes that this application contains potentially patentable material. The method for deriving a value of S according to a desired accuracy is not anticipated and is not made obvious by the prior art.

Conclusion

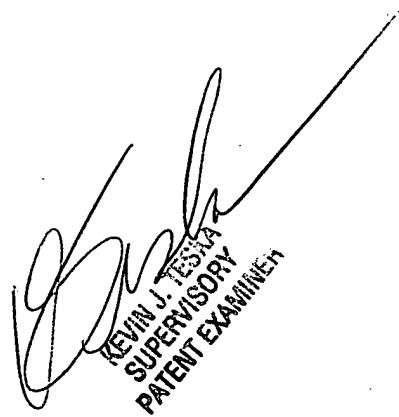
28. All pending claims stand rejected under 35 USC 101.
29. All other objections and rejections are withdrawn.

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Communication

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eduardo Garcia-Otero whose telephone number is 571-272-3711. The examiner can normally be reached on Monday through Thursday from 9:00 AM to 8:00 PM. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin Teska, can be reached at 571-272-3761. The fax phone number for this group is 703-872-9306.

* * * *



KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER